Dimensions of personality pathology in adolescents: Psychometric properties of the DAPP-BQ-A

Tromp, N.B.; Koot, H.M.

published in
Journal of Personality Disorders
2008

DOI (link to publisher)
10.1521/pedi.2008.22.6.623

document version
Publisher's PDF, also known as Version of record

Journal of Personality Disorders, 22(6), 623–638, 2008

DIMENSIONS OF PERSONALITY PATHOLOGY IN ADOLESCENTS: PSYCHOMETRIC PROPERTIES OF THE DAPP-BQ-A

Noor B. Tromp, MSc, and Hans M. Koot, PhD

This study aimed to contribute to the dimensional approach to personality pathology by addressing the applicability of a personality pathology questionnaire, originally developed for adults, in adolescent samples. The psychometric properties of the Dimensional Assessment of Personality Pathology-Basic Questionnaire for Adolescents (DAPP-BQ-A) were studied in two samples including 170 adolescents referred for mental health services and 1,628 nonreferred adolescents, respectively. Factor analysis resulted in a strong replication of the original structure, retaining four factors (Emotional Dysregulation, Dissocial Behavior, Inhibitedness, and Compulsivity), which could be further organized into a two-dimensional structure with factors identifiable as Internalizing and Externalizing, suggesting a possible link between personality and psychopathology. Internal consistency and test-retest reliability proved to be satisfactory for all lower-order dimensions, with the exception of Intimacy Problems. Several of these dimensions showed considerable promise in differentiating nonreferred adolescents, referred adolescents without and referred adolescents with a personality disorder. The present findings underscore the need for a developmental perspective on personality pathology. Promising aspects of the dimensional approach to personality pathology in adolescence are discussed.

A growing body of research recognizes the occurrence of personality pathology in adolescence, supporting its validity as a construct, and high prevalence in both clinical and nonclinical populations (for a review, see Johnson, Bromley, Bornstein, & Sneed, 2006). Moreover, longitudinal studies have provided evidence for a wide range of childhood and adolescent developmental antecedents of adult personality pathology (e.g., Johnson, Cohen, Brown, Smailes, & Bernstein, 1999; Kasen et al., 2001). Relatively little attention has been given to adolescent personality pathology as antecedent even though, according to some, childhood and adolescent temperament and personality are among the best candidates as general

From VU University Amsterdam, The Netherlands.

Address correspondence to N. B. Tromp, Department of Developmental Psychology, VU University Amsterdam, Van der Boechorststraat 1, 1081 BT Amsterdam, The Netherlands; E-mail: nb.tromp@psy.vu.nl

broadband developmental antecedents for adult personality disorders (cf., Mervielde, De Clercq, De Fruyt, & Van Leeuwen, 2005). Unfortunately, there is no widely accepted, reliable, and valid instrument for the assessment of personality pathology in adolescents.

In recent years, several instruments have been designed for the dimensional assessment of personality pathology in adults, including the Shedler-Westen Assessment Procedure (SWAP-200; Shedler & Westen, 1998), the Schedule for Nonadaptive and Adaptive Personality (SNAP; Clark, 1993), and the Dimensional Assessment of Personality Pathology-Basic Questionnaire (DAPP-BQ; Livesley & Jackson, in press; Livesley, Jackson, & Schroeder, 1992). Westen and colleagues (Westen, Shedler, Durrett, Glass, & Martens, 2003) introduced an adolescent version of the SWAP-200, the SWAP-200-A. Also, a youth version of the SNAP (SNAP-Y) is under construction (Linde, Clark, & Simms, 2003). In addition, the Dimensional Personality Symptom Item Pool (DIPSI; De Clercq, De Fruyt, Van Leeuwen, & Mervielde, 2006) was designed to assess trait-related symptoms in childhood, but has also been applied in an adolescent population. The SWAP-200-A, SNAP-Y, DIPSI, and DAPP-BQ showed adequate psychometric properties (Clark & Livesley, 2002; De Clercq et al., 2006; Linde et al., 2003; Livesley, Jang, & Vernon, 1998; Schroeder, Wormworth, & Livesley, 1992; Westen et al, 2003). Interestingly, with the exception of the SWAP-200, the instruments showed considerable convergence at the higher-order level in addition to conceptual similarities at the lower-order level (Clark & Livesley, 2002; De Clercq et al., 2006). Research has shown that the phenotypic factorial structure of the DAPP-BQ closely corresponds to the genetic structure, and that the structure is stable across clinical and nonclinical samples, as well as across cultures (Bagge & Trull, 2003; Livesley et al., 1992, 1998; Maruta, Yamate, Iimori, Kato, & Livesley, 2006; Pukrop, Gentil, Steinbring, & Steinmeyer, 2001; Schroeder et al., 1992; Van Kampen, 2002, 2006; Zheng et al., 2002). To our knowledge, only two studies have been reported that applied the DAPP-BQ in adolescent samples (Du et al., 2006; Krischer, Sevecke, Lehmkuhl, & Pukrop, 2007). However, both studies used translated versions of the original DAPP-BQ, which was designed for use in adult populations.

The present study aimed at assessing several psychometric properties of an age-appropriate version of the DAPP-BQ, denoted as the DAPP-BQ for Adolescents (DAPP-BQ-A), in nonreferred adolescents and adolescents referred for mental health services. First, this study examined the factorial structure of personality pathology in adolescents. It was expected that the structure in adolescents would be highly similar to the one found in adults and children, considering the evidence on the congruence of phenotypic and genetic structures, which suggests that environmental influences do not change the structure of trait covariation (Livesley, 2005), and the fact that the structure of the DIPSI in children and adolescents resembles the one in adults (De Clercq et al., 2006). However, certain personality dimensions may not yet have fully developed in adolescence (e.g., Intimacy Prob-

lems), possibly causing a deviation from the structure found in adults. In addition, it was expected that the DAPP-BQ-A structure in adolescents would align with hierarchical models proposed by Widiger and Simonsen (2005) and Mervielde and colleagues (2005), which suggest that the dimensions at the higher-order level can be further integrated into a two-dimensional structure representing Internalizing and Externalizing traits. These metatraits would provide a possible link between personality and psychopathology. Second, this study examined the internal consistency and test-retest reliability of the DAPP-BQ-A lower-order dimensions. Third, the present paper reports on the subsample differences on the DAPP-BQ-A dimensions, comparing three groups of nonreferred, referred non-PD (without a PD diagnosis), and referred PD adolescents (with a PD diagnosis). It was expected that referred adolescents would show more personality pathology than nonreferred adolescents, and that among the referred, those with a PD diagnosis would score higher than those without. Finally, this study explored the classification accuracy of the lower- and higher-order DAPP-BQ-A dimensions. Based on results of a study with the SNAP (Morey et al., 2003) in adults, it was expected that questionnaire based dimensions of personality pathology would show good accuracy differentiating nonreferred and referred adolescents, and moderate accuracy differentiating among referred adolescents.

METHOD

PARTICIPANTS AND PROCEDURES

Referred Sample. The referred sample consisted of adolescents referred to in- or outpatient mental health care in The Netherlands. Study procedures were approved by the Dutch Central Committee on Research involving Human Subjects. Within the first month after referral, participants completed the questionnaire individually at home or at the mental health centre. The sample consisted of 170 adolescents (34.1% male) with a mean age of 15.9 years ($SD = 2.3$; range 12 to 22 years). Participants completed the questionnaire in paper-and-pencil format ($n = 116$) or via internet ($n = 54$). Both groups did not differ on either age or gender. However, they did differ significantly on the DAPP-BQ-A dimensions Self Harm and Stimulus Seeking (Cohen's $d = 0.39$), Restricted Expression ($d = 0.40$), and Conduct Problems ($d = 0.50$), indicating higher scores for the adolescents in the paper-and-pencil group. However, these differences do not represent systematic methodological effects. ANOVAs showed that the effects were attributable to the scores of inpatients, the large majority of whom (87%) used paper-and-pencil format. Only for Conduct Problems a small but significant interaction effect of assessment format by referral status was found ($\eta^2 = 0.03$), indicating that the effect of assessment format was only significant for inpatients. Details regarding psychopathology are presented in Table 1.

TABLE 1. Psychopathology in the Referred Sample

Axis I disorders[a,b] (%)		Axis II disorders[a,c] (%)	
ADHD	7.0	Avoidant	14.9
ODD	8.8	Dependent	4.2
CD	6.4	Obsessive-Compulsive	7.7
Mood disorder	49.4	Paranoid	10.7
Psychotic disorder	15.3	Schizotypal	0.6
Substance use disorder	9.4	Schizoid	3.0
Anxiety disorder	40.0	Histrionic	0.0
Somatoform disorder	5.9	Narcissistic	0.6
Eating disorder	15.9	Borderline	16.7
Any axis I disorder	77.1	Antisocial	14.3
		Passive-Aggressive	7.1
		Depressive	19.6
		Any axis II disorder	41.7

[a]Respondents could be diagnosed with multiple disorders on Axis I and II; [b]Assessed with the Structured Clinical Interview for *DSM-IV* Axis I Disorders (SCID-I; First, Spitzer, Gibbon, & Williams, 1996) and parts of the Schedule for Affective Disorders and Schizophrenia for School-Age Children Present and Lifetime Version (K-SADS-PL; Kaufman et al., 1997); [c]Assessed with the Structured Clinical Interview for *DSM-IV* Personality Disorders (SCID-II).

Nonreferred Sample. Participants in the nonreferred sample were recruited from a total of 2,039 students of a public school, representing all levels of Dutch secondary education. Written informed consent was obtained from the adolescents and assent from their parents. In the presence of one of the researchers, respondents were class-administered the paper-and-pencil questionnaire during school hours. A total of 411 adolescents (20%) were excluded from the sample for various reasons (e.g., absence of participants during the scheduled time for assessment). The final sample consisted of 1,628 adolescents (80% of the original sample; 51.4% male) with a mean age of 14.6 years (SD = 1.7; range 11–20 years).

Test-Retest Sample. All adolescents in the referred sample who participated in the study during the last eight months of data collection (n = 79) were asked to fill out the DAPP-BQ-A twice with an interval of three weeks. Twenty-four adolescents (29% boys) with a mean age of 17.9 years (SD = 2.8; range 13–22 years) agreed to participate. In addition, 32 adolescents from the general population (28% boys) with a mean age of 19.3 years (SD = 2.9; range 14–23 years) completed the questionnaire twice via internet.

MEASURES

(DAPP-BQ-A). The 290-item DAPP-BQ-A was translated and adapted from its adult predecessor, the DAPP-BQ (Livesley & Jackson, in press), following several steps, using procedures similar to those described by Varni, Seid, and Rode (1999). First, the items were translated to Dutch, staying to the original text and meaning as closely as possible. Next, the translated items and instructions were modified to be age-appropriate.

This was accomplished by replacing difficult or uncommon words by synonyms from a children's dictionary. To make the items on sexual experiences more age-appropriate, instructions to also consider masturbation were added. In view of the possible differences in (psychological) development of the respondents, a comment was added on the wide age range of people participating in the study, resulting in possible unfamiliarity with listed behaviors or events for some participants. To accommodate the wide age range, the Likert-type scale was extended with a "not applicable"-option for nine questions on sex, drug, and alcohol use, which was recoded 1 (*very unlike me or not applicable*) before running the analyses. Third, the initial translation was evaluated by professionals working with relatively low-educated adolescents. Subsequently, after modifying the problematic items, the translation was pilot tested in 23 adolescents (age 12 to 19 years old) from the general population, representing a wide variety of educational levels. During pilot testing, 105 items were marked too difficult. These items were simplified (e.g., "I am destined for greatness" became "It is on my path to become an important person"). Fifth, the adapted items were translated back into English and sent to the author of the original DAPP-BQ for confirmation. Finally, following up on the author's feedback, the adolescent version was completed. In the final version, 105 items (36%) were adapted for adolescents and no items were deleted a priori. The number of adapted items per lower-order dimension ranged from 1 (Self Harm) to 11 (Affective Instability and Stimulus Seeking). Because of the substantial length of the questionnaire, the items were divided into three parts (two parts with 100 and one with 90 items), especially in view of internet assessment, which allowed participants to submit the questionnaire only if all items were completed.

The 290 self-report items assess 18 lower-order and 4 higher-order dimensions of personality pathology, which are listed in Tables 2 and 3. The items are scored on a Likert-type scale, ranging from 1 (*very unlike me or not applicable*) to 5 (*very like me*). Each of the lower-order dimensions is measured by 16 items that describe personal preferences and behaviors, except the scales for Self Harm and Suspiciousness, which contain 12 and 14 items, respectively. In addition, eight items are included to measure social desirability. The coefficient α reliabilities of the 18 scales of the original DAPP-BQ were found to range from .83 to .94, while 3-week test-retest reliabilities varied from .81 to .93 (Livesley et al., 1998).

(SCID-II). In the present study, the Dutch version (Weertman, Arntz, Dreessen, Van Velzen, & Vertommen, 2003) of the SCID-II (First, Spitzer, Gibbon, & Williams, 1997) was administered in the referred sample by one of two trained research psychologists, who were blind to the adolescents' DAPP-BQ-A scores, during a separate interview session within the first month after referral. Research has indicated that structured interviews can be used to assess PDs among adolescents in a reliable and valid manner (Brent, Zelenak, Bukstein, & Brown, 1990; Brent et al., 1993; Grilo, Becker, Edell, & McGlashan, 2001).

STATISTICAL ANALYSES

First, DAPP-BQ-A missing items (up to 10 per participant with a maximum of two within a lower-order dimension) were imputed with estimated values using the expectation-maximization method. For 631 participants one or more items were imputed (mean number of imputed items = .61). Second, to evaluate the factorial structure, principal components analyses (PCA) followed by varimax rotation were performed on the original lower-order dimensions in a combined sample of nonreferred and referred adolescents. Subsequently, Cronbach's α coefficients for the original lower-order dimensions were calculated in the nonreferred and referred sample separately. To assess 3-week test-retest reliabilities intraclass correlation coefficients (ICC) for absolute agreement were computed in a two-way random effects model. To examine mean subsample differences on the DAPP-BQ-A dimensions all adolescents were assigned to one of three subsamples: nonreferred, referred non-PD, and referred PD. Next, two multivariate analyses of covariance (MANCOVA) were conducted on the 18 lower- and 4 higher-order dimensions, respectively, with subsample membership and gender as independent variables, and age as covariate. Univariate analyses of variance were conducted as follow-up, as well as post-hoc analyses with Bonferroni correction to test the significance of the differences between the three subsamples. Finally, Receiver Operating Characteristic (ROC) analyses were used to examine the ability of the DAPP-BQ-A dimensions to distinguish between subsamples.

RESULTS

FACTORIAL STRUCTURE

The eigenvalues greater than 1 obtained from PCA of the 18 lower-order dimensions were 7.836, 2.574, 1.563, and 1.027, suggesting a four-factor or, based on the elbow in these values, two-factor model, explaining 72.2% and 57.8% of the total variance, respectively. The columns labeled 1, 2, 3, and 4 in Table 2 show the factor loadings for the lower-order dimensions after varimax rotation of the first four factors. The four-factor solution was highly similar to the four-factor structure of the original DAPP-BQ. The first factor (35.2% accounted variance) was clearly identifiable as the original dimension of Emotional Dysregulation. Factor 2 (18.8%) appeared an accurate replication of the original Dissocial Behavior dimension. The third factor (9.4%) was identical to the original Inhibitedness dimension. The fourth factor (8.8%) conformed to the original dimension of Compulsivity, with an additional loading of Narcissism. The two-factor solution represented an Internalizing (37.2%) and Externalizing (20.7%) factor. The columns labeled INT and EXT in Table 2 show the factor loadings for the lower-order dimensions when retaining two factors. The Internalizing factor was characterized primarily by the lower-order dimensions within

TABLE 2. Varimax-Rotated Principal Component Factor Loadings (N = 1,798) for Four- and Two-Factor Structure, Internal Consistency (Cronbach's α; N = 170/1,628), and Test-Retest Reliability (ICC; N = 56) for DAPP-BQ-A Lower-Order Dimensions

	Factor loadings four-factor structure				Factor loadings two-factor structure		Internal consistency		
Dimension[a]	**1**	**2**	**3**	**4**	**INT**	**EXT**	**Referred**	**Nonreferred**	**Test-retest reliability**
Submissiveness	**.77**	.03	.14	.20	**.80**	.09	.91	.85	.80
Cognitive Distortion	**.85**	.20	.12	.09	**.83**	.28	.91	.87	.85
Identity Problems	**.82**	.13	.38	–.03	**.85**	.19	.78	.88	.82
Affective Instability	**.84**	.26	.01	.14	**.79**	.35	.90	.86	.91
Oppositionality	**.59**	.55	.00	–.10	.48	**.61**	.87	.84	.86
Anxiety	**.90**	.06	.08	.17	**.89**	.14	.94	.91	.88
Social Avoidance	**.76**	.03	.37	.25	**.86**	.08	.91	.89	.91
Suspiciousness	**.64**	.32	.25	.32	**.71**	.37	.88	.79	.84
Insecure Attachment	**.74**	.11	–.26	.21	**.65**	.31	.93	.89	.92
Narcissism	.45	.49	–.13	**.50**	.46	**.53**	.88	.86	.89
Self Harm	**.65**	.14	.29	–.21	**.62**	.19	.97	.92	.95
Stimulus Seeking	.16	**.78**	–.12	–.22	.01	**.80**	.86	.87	.85
Callousness	.09	**.84**	.20	.16	.11	**.82**	.86	.83	.96
Rejection	.07	**.78**	–.06	.39	.08	**.78**	.87	.85	.80
Conduct Problems	.11	**.81**	.14	–.21	.03	**.81**	.89	.89	.95
Restricted Expression	.51	.06	**.60**	.14	**.67**	.07	.67	.82	.76
Intimacy Problems	.11	.03	**.84**	–.08	**.32**	–.02	.71	.73	.07
Compulsivity	.23	–.11	.01	**.82**	**.41**	–.09	.87	.85	.86

Note. For each dimension, highest loadings appear in bold face. Cross-loadings of ≥ .40 are underlined. ICC = intraclass correlation coefficient. DAPP-BQ-A = Dimensional Assessment of Personality Pathology-Basic Questionnaire for Adolescents. INT = Internalizing. EXT = Externalizing.

[a]Dimensions consist of 16 items, except for Self Harm (12 items) and Suspiciousness (14 items).

All ICCs, except for Intimacy Problems, significant at $p < .001$.

Emotional Dysregulation, Inhibitedness, and Compulsivity. The Externalizing factor was characterized primarily by the lower-order dimensions of Dissocial Behavior and to a lesser extent by Oppositionality and Narcissism from the Emotional Dysregulation factor.

INTERNAL CONSISTENCY AND TEST-RETEST RELIABILITY

The Cronbach's α coefficients are presented in Table 2 for referred (N = 170) and nonreferred (N = 1,628) adolescents separately. The internal consistency reliability of the 18 lower-order dimensions showed a median of .88 in the referred (range .67–.97) and .86 in the nonreferred sample (range .73–.92). Because relatively low α coefficients were found for Intimacy Problems in both samples (.71 and .73, respectively), it was investigated whether this could be attributable to age-effects. However, α coefficients computed for subsamples of younger (12 to 16 years) and older adolescents (17 years and up) did not differ (.67 and .66 for the referred, and .72 and .78 for the nonreferred sample). To further investigate the

relatively low α coefficients, an additional PCA on the Intimacy Problems items was performed. The analysis yielded four factors with eigenvalues greater than 1. The first strong factor (α = .82) included all six items on love relationships, the second (α = .71) included all five items on sexual experiences, the third (α = .60) included three items on intimate, nonlove relationships, and the fourth was a less easily interpretable factor (α = .31) including the remaining two items. The final column of Table 2 presents test-retest reliabilities. The interval period ranged from 16 to 31 days, with a mean of 22 days (*SD* = 3). The intraclass correlation coefficient was excellent for all scales (*M* = .82), except Intimacy Problems (.07).

SUBSAMPLE DIFFERENCES

Mean subsample differences on the DAPP-BQ-A lower- and higher-order dimensions between nonreferred, referred non-PD, and referred PD adolescents were examined. The age of 16 participants in the nonreferred sample (1%) was unknown. Therefore, this subsample consisted of 1,612 adolescents (51% boys) with a mean age of 14.6 years (*SD* = 1.7, range 11–20). In the referred sample, a diagnosis on Axis II was missing for 2 participants. Consequently, the referred subsample consisted of 168 adolescents, comprising 98 non-PD adolescents (36% boys) with a mean age of 15.9 years (*SD* = 2.5, range 12–22) and 70 PD adolescents (33% boys) with a mean age of 15.9 years (*SD* = 2.1, range 12–22).

Means and standard deviations for the lower- and higher-order dimensions are presented in Table 3 for the three subsamples. Because of the large sample size, a significance level of .01 was adhered to in reporting significant results. The result of the MANCOVAs on the lower- and higher-order dimensions showed that the overall effect of subsample was significant, Wilk's $\lambda = 0.563$, $F(36, 3516) = 32.54$, $p < .001$ for the lower-order dimensions and Wilk's $\lambda = 0.783$, $F(8, 3544) = 57.65$, $p < .001$ for the higher-order dimensions. All ANOVAs conducted as follow-up were statistically significant.

Table 3 also presents the effect sizes, represented by partial eta squared, for gender, age, and subsample. Significant gender effects were found for all but five lower-order and all higher-order dimensions (with Compulsivity included at both levels). Although significant, effects were small in terms of Cohen's (1988) criteria for all but three dimensions: medium effects were found for Callousness and Dissocial Behavior, and a large effect for Conduct Problems, all indicating higher scores for males. All significant age effects indicated an age-related increase of scores, although effects were small or negligible in terms of Cohen's criteria. Significant overall subsample effects were found for all 18 lower-order and 4 higher-order dimensions. The final column in Table 3, labelled Contrasts, shows the results of post hoc analyses with Bonferroni correction when controlling for age. For all but seven lower- and two higher-order dimensions (with Compulsivity included at both levels) referred PD adolescents scored high-

TABLE 3. Mean Scores and Standard Deviations (SD) on DAPP-BQ-A Dimensions for Nonreferred Adolescents (Subsample 1), Referred Non-PD Adolescents (Subsample 2), and Referred PD Adolescents (Subsample 3), and Effect Sizes (ES, Partial Eta Squared) for Gender, Age, and Subsample with Contrasts

	Non-referred (*N* = 1,612)		Referred non-PD (*N* = 98)		Referred PD (*N* = 70)		ES			
Dimension	**Mean**	***SD***	**Mean**	***SD***	**Mean**	***SD***	**Gender**	**Age**	**Sub-sample**	**Contrasts[a]**
Emotional Dysregulation	349.4	79.3	425.8	101.1	531.0	113.5	0.02 G	*ns*	0.16	1 < 2 < 3
Submissiveness	33.0	8.8	38.4	11.3	45.0	14.6	0.03 G	*ns*	0.06	1 < 2 < 3
Cognitive Distortion	30.0	9.7	35.9	12.1	46.9	14.6	0.02 G	*ns*	0.10	1 < 2 < 3
Identity Problems	28.7	9.4	42.6	9.8	52.1	10.5	0.01 G	*ns*	0.23	1 < 2 < 3
Affective Instability	35.1	10.1	43.9	12.4	55.8	12.3	0.04 G	*ns*	0.14	1 < 2 < 3
Oppositionality	39.2	9.8	42.5	11.7	49.5	11.6	*ns*	0.02	0.03	(1 = 2) < 3
Anxiety	35.0	11.5	46.2	15.7	55.7	16.3	0.05 G	*ns*	0.11	1 < 2 < 3
Social Avoidance	31.8	10.4	40.9	13.6	50.1	14.2	0.01 G	*ns*	0.11	1 < 2 < 3
Suspiciousness	29.0	7.3	32.4	9.1	42.9	11.5	*ns*	*ns*	0.12	1 < 2 < 3
Insecure Attachment	34.1	10.7	40.7	14.0	48.1	16.3	0.06 G	*ns*	0.06	1 < 2 < 3
Narcissism	38.8	10.3	40.3	11.2	45.3	13.4	*ns*	0.01	0.01	(1 = 2) < 3
Self Harm	14.7	5.9	22.0	12.8	39.6	17.0	*ns*	*ns*	0.32	1 < 2 < 3
Dissocial Behavior	146.0	34.1	139.2	27.7	173.6	41.6	0.13 B	0.03	0.03	(1 = 2) < 3
Stimulus Seeking	43.4	11.2	42.1	10.9	51.3	13.0	0.05 B	*ns*	0.02	(1 = 2) < 3
Callousness	33.5	9.3	30.5	9.0	37.8	12.5	0.12 B	0.01	0.02	(1 = 2) < 3
Rejection	40.6	10.2	40.8	9.7	45.1	13.5	0.05 B	0.02	0.01	1 = 2, 1 < 3
Conduct Problems	28.6	10.8	25.9	8.7	39.4	13.8	0.15 B	0.05	0.05	(1 > 2) < 3
Inhibitedness	70.7	13.7	83.6	13.3	94.2	11.7	0.01 B	*ns*	0.13	1 < 2 < 3
Restricted Expression	38.0	9.3	44.6	8.5	49.4	7.7	*ns*	*ns*	0.08	1 < 2 < 3
Intimacy Problems	32.7	7.5	39.0	8.8	44.8	8.4	0.01 B	*ns*	0.11	1 < 2 < 3
Compulsivity	41.1	9.8	43.5	10.2	44.6	12.6	0.01 G	*ns*	0.01	1 = 2 = 3

Note. Lower-order Compulsivity was omitted because it is identical to higher-order Compulsivity. DAPP-BQ-A = Dimensional Assessment of Personality Pathology-Basic Questionnaire for Adolescents. PD = personality disorder. *ns* = non-significant. B = higher scores for boys; G = higher scores for girls ($p < .01$). All significant age effects reflected higher scores for older adolescents ($p < .01$).

[a]with Bonferroni correction ($p < .01$).

est and nonreferred adolescents scored lowest ($p < .01$). In terms of Cohen's criteria, large effects (≥ .138) were found for Emotional Dysregulation, Identity Problems, and Self Harm.

CLASSIFICATION ACCURACY

Table 4 shows the area under the ROC curve (AUC) with accompanying 95% confidence intervals. Fourteen lower-order dimensions and all but one higher-order dimension showed significant ($p < .01$) accuracy for the discrimination between nonreferred and referred adolescents. Identity Problems and Inhibitedness performed particularly well. In distinguishing

TABLE 4. Area Under the ROC-Curve (AUC) for DAPP-BQ-A Dimensions for Nonreferred Adolescents, Referred non-PD Adolescents, and Referred PD Adolescents

	Nonreferred (*N* = 1,628) vs. referred (*N* = 170)		Nonreferred (*N* = 1,628) vs. referred PD (*N* = 70)		Referred non-PD (*N* = 98) vs. referred PD (*N* = 70)	
Dimension	**AUC**	**95% CI**	**AUC**	**95% CI**	**AUC**	**95% CI**
Emotional Dysregulation	.79*	.75–.83	.89*	.84–.94	.76*	.69–.84
Submissiveness	.70*	.65–.75	.77*	.70–.84	.64*	.55–.73
Cognitive Distortion	.72*	.68–.77	.82*	.77–.88	.72*	.64–.80
Identity Problems	.89*	.87–.91	.94*	.91–.96	.75*	.67–.83
Affective Instability	.79*	.75–.83	.90*	.86–.93	.74*	.67–.82
Oppositionality	.66*	.61–.71	.77*	.70–.83	.68*	.60–.76
Anxiety	.77*	.72–.81	.84*	.78–.90	.67*	.58–.75
Social Avoidance	.76*	.72–.81	.85*	.79–.91	.68*	.60–.76
Suspiciousness	.70*	.66–.75	.84*	.78–.89	.76*	.69–.83
Insecure Attachment	.69*	.64–.73	.75*	.68–.82	.64*	.55–.72
Narcissism	.58*	.54–.63	.65*	.58–.72	.61	.53–.70
Self Harm	.76*	.72–.81	.87*	.81–.93	.77*	.70–.85
Dissocial Behavior	.55	.50–.59	.70*	.63–.77	.76*	.69–.84
Stimulus Seeking	.56	.51–.60	.68*	.61–.75	.71*	.63–.79
Callousness	.48	.43–.52	.59*	.52–.66	.69*	.61–.77
Rejection	.54	.50–.59	.60*	.53–.68	.60	.51–.69
Conduct Problems	.56	.51–.61	.73*	.67–.79	.79*	.72–.87
Inhibitedness	.82*	.78–.85	.90*	.87–.94	.73*	.65–.80
Restricted Expression	.76*	.72–.80	.83*	.78–.87	.66*	.58–.75
Intimacy Problems	.76*	.72–.80	.85*	.80–.90	.68*	.60–.76
Compulsivity	.57*	.53–.62	.58	.50–.65	.51	.42–.61

Note. Lower-order Compulsivity was omitted because it is identical to higher-order Compulsivity. DAPP-BQ-A = Dimensional Assessment of Personality Pathology-Basic Questionnaire for Adolescents. PD = personality disorder. AUC = Area Under the Curve. CI = confidence interval.
*$p < .01$.

between nonreferred and referred PD adolescents, all higher- and lower-order dimensions, with the exception of Compulsivity, showed significant accuracy. Several dimensions performed particularly well: Emotional Dysregulation, Cognitive Distortion, Identity Problems, Affective Instability, Anxiety, Social Avoidance, Suspiciousness, Self Harm, Inhibitedness, Restricted Expression, and Intimacy Problems. All but one higher-order dimension (Compulsivity) as well as all but three lower-order dimensions (Narcissism, Rejection, and Compulsivity) showed significant accuracy in the distinction between referred non-PD and referred PD adolescents. Dimensions performing best were Emotional Dysregulation, Suspiciousness, Self Harm, Dissocial Behavior, and Conduct Problems.

DISCUSSION

The aim of the present study was to assess psychometric properties of an adapted version of the DAPP-BQ in adolescents, the DAPP-BQ-A. The present study is one of the first to implement the DAPP-BQ in adolescent samples. Overall, analyses indicated that the DAPP-BQ-A is a reliable and valid measure of personality pathology dimensions in adolescents.

An examination of the factorial structure of the DAPP-BQ-A showed two clearly interpretable solutions of two and four factors, respectively. The two-factor solution resulted in factors identifiable as Internalizing and Externalizing, and was a strong replication of the two factor structure of trait pathology in children, as assessed by the DIPSI (De Clercq et al., 2006). The four-factor structure was a strong replication of the structure of the original DAPP-BQ found previously in both clinical and nonclinical adult samples as well as across culture, and accounted for a comparably large amount of variance (Bagge & Trull, 2003; Livesley et al., 1992; Maruta et al., 2006; Pukrop et al., 2001; Schroeder et al., 1992; Van Kampen, 2002, 2006; Zheng et al., 2002). In addition, the four factors showed clear correspondence to the factors of the DIPSI in children and adolescents (De Clercq et al., 2006). The evidence for a similar structure across childhood, adolescence, and adulthood underscores the need for a developmental perspective on personality pathology.

The conceptual similarities between the two metatraits of personality pathology recovered in the present study and the two factors of Internalizing and Externalizing, comprising the taxonomy of psychopathology in childhood and adolescence (Achenbach & McConaughy, 1997), suggest that two common factors are underlying both personality and psychopathology. These broad factors delineating both constructs have been previously described for adults (Krueger & Tackett, 2003; Widiger & Simonsen, 2005), as well as for children and adolescents (Mervielde et al., 2005). Widiger and Simonsen suggested a four-level hierarchical structure with two clinical spectra of internalization and externalization at the highest level, followed by three to five broad dimensions of personality at the second level. The third and fourth levels consist of personality trait scales and the more behaviorally specific diagnostic criteria, respectively. Mervielde and colleagues proposed a hierarchical dimensional model linking temperament, personality, and psychopathology in childhood and adolescence, suggesting at the maladaptive end two broad dimensions of Internalizing and Externalizing traits that comprise the highest level, with the four factors of the DIPSI immediately underneath. The structure of the DAPP-BQ-A found in the present study closely resembles these models. The two- and four-factor solutions are represented at the highest two levels, and the 18 lower-order dimensions are represented at Widiger and Simonsen's third or fourth level, depending on either a trait-like (e.g., submissiveness) or behavioral (e.g., self-harm) definition. The results seem to suggest that the two- and four-factor solutions should not be regarded mutually exclusive. Instead, the DAPP-BQ-A structure retrieved in the present study provides empirical support for a hierarchical dimensional model of personality pathology in adolescence, showing similarities to the models proposed for children and adults. Again, this underscores the need for a developmental perspective on personality pathology. In addition, the results seem to support the joint structure of personality and psychopathology, associating

dimensional models of normal and abnormal personality, and psychopathological constructs of clinical and personality disorders (Krueger & Tackett, 2003).

Despite overall high concordance of the present structure with those found in other studies, one finding merits further attention. The construct of narcissism may not be as clearly defined in adolescence as it is in adulthood. This lower-order dimension showed high loadings on three of the four higher-order dimensions. Interestingly, multivariate genetic analyses showed that Narcissism was influenced by two genetic factors: need for approval which loaded on Emotional Dysregulation, and grandiosity which loaded on Dissocial Behavior (Livesley, 2005). The loadings on Emotional Dysregulation and Dissocial Behavior in the current study possibly reflected the two underlying genetic dimensions. The high loading of Narcissism on Compulsivity has not been reported for adult samples. A possible explanation lies within the reported saliency of adolescents' heightened concern with grooming and appearance on both Narcissism and Compulsivity (Livesley, Jackson, & Schroeder, 1989). The operationalization of narcissistic tendencies in the DAPP-BQ-A needs further investigation.

The internal consistency and 3-week test-retest reliabilities of the subscales, except Intimacy Problems, were good and comparable to studies in adult samples (Maruta et al., 2006; Schroeder et al., 1992; Van Kampen, 2002, 2006; Zheng et al., 2002). In addition, internal consistency was similar to values reported previously for adolescents (Krischer et al., 2007). Interestingly, relatively low α coefficients for Intimacy Problems were found in both the present and the Krischer et al. study. The present results also showed low test-retest reliability for Intimacy Problems, and PCA on the items of this dimension resulted in four factors. Interestingly, 6 of the 10 items in the total questionnaire with item-total correlations below .20 belonged to Intimacy Problems. The difficulties with this dimension could be due to problematic content or phrasing of the items. In terms of content, the Intimacy Problems items concern love relationships and sexual experiences. The relative lack of experience in these domains, especially of the younger adolescents, could make a reliable assessment of intimacy problems difficult. Conceptual comparison of the childhood DIPSI scales with the DAPP-BQ dimensions did not yield an equivalent for Intimacy Problems (De Clercq et al., 2006). The authors argued that the trait of inhibited sexuality is uncommon in childhood. However, the moderate to high α coefficients of the first two factors within the Intimacy Problems dimension, including items on love relationships and sexual experiences, contradict that problematic content explains the difficulties with this dimension. A second possible explanation lies in problematic phrasing. Five of the six items contain negative phrasing (i.e., "not" or "nobody"). In completing questionnaires, participants usually experience more difficulty responding to items with negations (cf., Nunnally & Bernstein, 1994). The Intimacy

Problems items, as translated and adapted in the DAPP-BQ-A, may represent a heterogeneous construct in adolescence and need further investigation.

The examination of the subsample differences yielded several interesting results. First, the dimensions Emotional Dysregulation, Identity Problems, and Self Harm seemed especially useful in the distinction between nonreferred, referred non-PD, and referred PD adolescents, showing higher scores with higher levels of (personality) pathology. High levels of classification accuracy for these dimensions support these findings. Second, traits associated with dissocial behavior seemed especially indicative of personality pathology. This finding was confirmed by significant levels of classification accuracy for the majority of these traits when referred non-PD and referred PD adolescents were compared. Since the DAPP-BQ-A was designed to assess personality pathology specifically, these results were especially satisfying. Distinguishing among subsamples within a referred population is a difficult endeavour. For example, in the present study, the non-PD group also included adolescents who did meet several PD-criteria, but not above the threshold set to qualify for any specific PD diagnosis. Moreover, co-occurrence between Axis I and Axis II disorders may have complicated the distinction between referred non-PD and referred PD adolescents. In the present sample, 100% of PD adolescents qualified for one or more diagnoses on Axis I.

Several issues seem particularly interesting for future research on adolescent personality pathology. In view of the ongoing debate on a dimensional versus a categorical approach to personality pathology, an interesting topic concerns the relations between dimensions of personality pathology and the PD categories described in the *DSM-IV* (American Psychiatric Association, 2000) among adolescents. Results may elucidate how these two approaches map onto each other. Research on the relations between dimensions of pathological and normal personality may facilitate the search for a dimensional model that is capable of capturing all adaptive and maladaptive aspects of personality. Results of such studies should be related to results reported for adult populations, in order to examine developmental aspects. Considering the findings of the present study, the DAPP-BQ-A could be a valuable operationalization of the dimensional approach to personality pathology in these future studies, creating at the same time the possibility to investigate the convergent and concurrent validity as well as the clinical utility of the DAPP-BQ-A. In addition, the DAPP-BQ-A may be applied in longitudinal studies examining theories on the developmental trajectories of temperament, personality (pathology) and psychopathology, described in the work of Caspi and Shiner (2006), as well as by Mervielde and colleagues (2005). Future research should be focused on gaining insight into the structure, developmental aspects, and core features of adolescent personality pathology, and its relations to psychopathology.

REFERENCES

Achenbach, T. M., & McConaughy, S. H. (1997). Empirically based assessment of child and adolescent psychopathology: Practical applications (2nd ed.). Thousand Oaks, CA: Sage.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington DC: Author.

Bagge, C. L., & Trull, T. J. (2003). DAPP-BQ: Factor structure and relations to personality disorder symptoms in a nonclinical sample. *Journal of Personality Disorders, 17,* 19–32.

Brent, D. A., Johnson, B. A., Bartle, S., Bridge, J., Rather, C., Matta, J., et al. (1993). Personality disorder, tendency to impulsive violence, and suicidal behavior in adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 32,* 69–75.

Brent, D. A., Zelenak, J. P., Bukstein, O., & Brown, R. V. (1990). Reliability and validity of the structured interview for personality disorders in adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 29,* 349–354.

Caspi, A., & Shiner, R. L. (2006). Personality development. In W. Damon & R. Lerner (Series Eds.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology, Vol. 3. Social, emotional, and personality development* (6th ed., pp. 300–365). New York: Wiley.

Clark, L. A. (1993). *Manual for the schedule for non-adaptive and adaptive personality.* Minneapolis: University of Minnesota Press.

Clark, L. A., & Livesley, W. J. (2002). Two approaches to identifying the dimensions of personality disorder: Convergence on the five-factor model. In P. T. Costa & T. A. Widiger (Eds.), *Personality disorders and the five-factor model of personality* (2nd ed., pp. 161–176). Washington, DC: American Psychological Association.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

De Clercq, B., De Fruyt, F., Van Leeuwen, K., & Mervielde, I. (2006). The structure of maladaptive personality traits in childhood: A step toward an integrative developmental perspective for *DSM-V. Journal of Abnormal Psychology, 115,* 639–657.

Du, J., Li, J., Wang, Y., Jiang, Q., Livesley, W. J., Jang, K. L., et al. (2006). Event-related potentials in adolescents with combined ADHD and CD disorder: A single stimulus paradigm. *Brain and Cognition, 60,* 70–75.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J.B.W. (1996). *Structured clinical interview for axis I DSM-IV disorders—patient edition (SCID-I/P).* New York: Biometrics Research Department, New York State Psychiatric Institute.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J.B.W. (1997). *Structured clinical interview for DSM-IV personality disorders* (SCID-II). Washington, DC: American Psychiatric Press.

Grilo, C. M., Becker, D. F., Edell, W. S., & McGlashan, T. H. (2001). Stability and change of DSM-III-R personality disorder dimensions in adolescents followed up 2 years after psychiatric hospitalization. *Comprehensive Psychiatry, 42,* 364–368.

Johnson, J. G., Bromley, E., Bornstein, R. F., & Sneed, J. R. (2006). Adolescent personality disorders. In D. A. Wolfe & E. J. Mash (Eds.), *Behavioral and emotional disorders in children and adolescents: Nature, assessment, & treatment* (pp. 463–484). New York: Guilford Press.

Johnson, J. G., Cohen, P., Brown, J., Smailes, E., & Bernstein, D. (1999). Childhood maltreatment increases risk for personality disorders during young adulthood: Findings of a community-based longitudinal investigation. *Acta Psychiatrica Scandinavica, 102,* 265–275.

Kasen, S., Cohen, P., Skodol, A. E., Johnson, J. G., Smailes, E., & Brook, J. S. (2001). Alternative pathways of continuity: Childhood depression and adult personality disorder. *Archives of General Psychiatry, 58,* 231–236.

Kaufman, J., Birmaher, B., Brent, D., Rao, U., Flynn, C., Moreci, P., et al. (1997). Schedule for affective and schizophre-

nia for school-age children-present and lifetime version (K-SADS-PL): Initial reliability and validity data. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 980–988.

Krischer, M. K., Sevecke, K., Lehmkuhl, G., & Pukrop, R. (2007). Dimensional assessment of personality pathology in female and male juvenile delinquents. *Journal of Personality Disorders, 21,* 675–689.

Krueger, R. F., & Tackett, J. L. (2003). Personality and psychopathology: Working toward the bigger picture. *Journal of Personality Disorders, 17,* 109–128.

Linde, J. A., Clark, L. A., & Simms, L. J. (2003). Psychometric properties of the schedule for nonadaptive and adaptive personality–youth version (SNAP-Y). Unpublished manuscript, University of Iowa.

Livesley, W. J. (2005). Behavioral and molecular genetic contributions to a dimensional classification of personality disorders. *Journal of Personality Disorders, 19,* 131–155.

Livesley, W. J., & Jackson, D. N. (in press). *Manual for the dimensional assessment of personality pathology.* Port Huron, MI: Sigma Press.

Livesley, W. J., Jackson, D. N., & Schroeder, M. L. (1989). A study of the factorial structure of personality pathology. *Journal of Personality Disorders, 3,* 292–306.

Livesley, W. J., Jackson, D. N., & Schroeder, M. L. (1992). Factorial structure of traits delineating personality disorders in clinical and general population samples. *Journal of Abnormal Psychology, 101,* 432–440.

Livesley, W. J., Jang, K. L., & Vernon, P. A. (1998). Phenotypic and genetic structure of traits delineating personality disorder. *Archives of General Psychiatry, 55,* 941–948.

Maruta, T., Yamate, T., Iimori, M., Kato, M., & Livesley, W. J. (2006). Factor structure of the dimensional assessment of personality pathology-basic questionnaire and its relationship with the revised NEO personality inventory in a Japanese sample. *Comprehensive Psychiatry, 47,* 528–533.

Mervielde, I., De Clercq, B., De Fruyt, F., & Van Leeuwen, K. (2005). Temperament, personality, and developmental psychopathology as childhood antecedents of personality disorders. *Journal of Personality Disorders, 19,* 171–201.

Morey, L. C., Warner, M. B., Shea, M. T., Gunderson, J. G., Sanislow, C. A., Grilo, C., et al. (2003). The representation of four personality disorders by the schedule for nonadaptive and adaptive personality dimensional model of personality. *Psychological Assessment, 15,* 326–332.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.

Pukrop, R., Gentil, I., Steinbring, I., & Steinmeyer, E. (2001). Factorial structure of the German version of the dimensional assessment of personality pathology-basic questionnaire in clinical and nonclinical samples. *Journal of Personality Disorders, 15,* 450–456.

Schroeder, M. L., Wormworth, J. A., & Livesley, W. J. (1992). Dimensions of personality disorder and their relationships to the big five dimensions of personality. *Psychological Assessment, 4,* 47–53.

Shedler J., & Westen, D. (1998). Refining the measurement of axis II: A Q-sort procedure for assessing personality pathology. *Assessment, 5,* 335–355.

Van Kampen, D. (2002). The DAPP-BQ in The Netherlands: Factor structure and relationship with basic personality dimensions. *Journal of Personality Disorders, 16,* 235–254.

Van Kampen, D. (2006). The Dutch DAPP-BQ: Improvements, lower- and higher-order dimensions, and relationship with the 5DPT. *Journal of Personality Disorders, 20,* 81–101.

Varni, J. W., Seid, M., & Rode, C. A. (1999). The PedsQL: Measurement model for the pediatric quality of life inventory. *Medical Care, 37,* 126–139.

Weertman, A., Arntz, A., Dreessen, L., van Velzen, C., & Vertommen, S. (2003). Short-interval test-retest interrater reliability of the Dutch version of the structured clinical interview for DSM-IV personality disorders SCID-II. *Journal of Personality Disorders, 17,* 562–567.

Westen, D., Shedler J., Durrett, C., Glass, S., & Martens, A. (2003). Personality diag-

noses in adolescence: DSM-IV axis II diagnoses and an empirically derived alternative. *American Journal of Psychiatry, 160,* 952–966.

Widiger, T. A., & Simonsen, E. (2005). Alternative dimensional models of personality disorders: Finding a common ground. *Journal of Personality Disorders, 19,* 110–130.

Zheng, W., Wang, W., Huang, Z., Sun, C., Zhu, J., & Livesley, W. J. (2002). The structure of traits delineating personality disorder in a Chinese sample. *Journal of Personality Disorders, 16,* 477–486.